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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/878,104	06/08/2001	Kevin W. Kobayashi	12-1101	2370

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Patent Counsel
TRW Inc.
S&E Law Department, E2/6051
One Space Park
Redondo Beach, CA 90278

EXAMINER

NGUYEN, KHAI M

ART UNIT

PAPER NUMBER

2819

DATE MAILED: 07/31/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/878,104

Applicant(s)

KOBAYASHI, KEVIN W.

Examiner

Khai M. Nguyen

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Specification

1. The examiner notices that there are some typographical errors, for example, on page 5, lines 5-6, 19, & 26. "Figs. 3a-3c" (it should read 5A-5C); and Figs. 5A and 5B (it should read 6A and 6B). The examiner encourages the applicant should recheck the whole specification for more typographical errors.

Claim Objections

Claim 1 is objected because of the used terms are not consistent. On line 1, the claim recites "**A predistortion circuit** for a power amplifier, **the predistortion** (circuit?) comprising:" and lines 2 to 4 the claim recites "**the** bias levels... **said** bias levels".

Correction is required.

Claim 2 is objected because of the used term is not consistent with the previous claim, "**said predetermined characteristics** (of the RF signal) is **gain** as a function of input power level". Correction is required.

Claim 3 is also objected because of the claim recites "**the bias level is selected**" which is unclear to the examiner that which of the bias levels the applicant referring to. Clarification or correction is required.

Claim 7 is objected because of the used term is not consistent with the previous claim "**said (upstream?) predistortion circuit**" Correction or clarification is required.

Claim 8 is objected because of the used terms are not consistent. On line 1, the claim recites "The **linear power amplifier**..., wherein said **power amplifier**". Correction or clarification is required.

Claim 9 is objected because of "**said predistortion circuit**" is not consistent with the independent claim. Correction is required.

Claim 10, recited "power amplifier", is not clear. It should read "**the power amplifier**". Correction or clarification is required.

Claim 11 is objected because of the used term is not consistent with the claim it referred to. On line 1 of the claim 11 recited "**said predistortion circuit**" and the claim 6 recited as "**upstream predistortion circuit**". Are they meant the same? Clarification or correction is required.

Claims 12-13 are objected because of the used term is not consistent. On line 3 of claim 12 recites "**upstream predistortion circuit**" and on line 5 of the claim 12 recites "**said predistortion circuit**". The same objection is applied to the claim 13. Correction or clarification is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 9, recited "the output gain of **the circuit is... the input range**", lacks antecedent basis. Correction is required.

Claim 14 recites "The linear power amplifier circuit as recited in **claim 6** (where it should read as claim 12), **said tuning means... the predistortion circuit... the output of the gain of the circuit is relatively linear over the input range of the power amplifier.**" lacks antecedent basis. Correction is required.

Claim 15 recites "The linear power amplifier circuit as recited in **claim 6**, where **power amplifier** is..." lacks antecedent basis. Correction is required.

Claim 16, recites "...wherein **said tuning means** includes means for electronically tuning **the predistortion circuit** such that **the phase** characteristic of **the circuit** is relatively linear over **the input range** of the power amplifier", lacks antecedent basis. Correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

4. Claims 1, 2, 4, and 6-8 are rejected under 35 U.S.C. 102(a) as being anticipated by Li (US 6,242,979).

Regarding claim 1, Li teaches (figure 2) a predistortion circuit for power amplifier that comprises: a Doherty amplifier, which includes a carrier amplifier (206), a peak amplifier (212); and a signal predistortor circuit (210) interconnected with the Doherty amplifier for selecting bias levels or providing cancellation of intermodulation signals (see column 1, lines 42-62 and column 3, lines 14-34).

Regarding claim 2, Li discloses (see figure 2) that the gain of the predistortion amplifier is as a function of input power (gain = amplified carrier output signal/input carrier signal).

Regarding claim 4, Li teaches that one of the predetermined characteristics is phase (column 3, lines 34-39).

Regarding claim 6, Li teaches (figure 2) that linear power amplifier circuit comprising: a power amplifier (200) having predetermined characteristics as a function of RF input power and upstream predistortion circuit (210) having characteristics selected to compensate for the predetermined characteristics of the power amplifier as a function of input power.

Regarding claim 7, Li teaches that the linear the linear power amplifier circuit is configured as a Doherty amplifier (with two transmission paths 216 and 220).

Regarding claim 8, Li discloses that the linear power amplifier is configured as a Doherty amplifier having a predetermined gain compression characteristic as a function of input power (gain = amplified carrier output signal/input carrier signal).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 3, 5, and 9-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li (US 6,242,979) in view of Gentzler (US 6,211,733).

Regarding claims 3 & 5, Li discloses the claimed invention except that particular bias level. It would have been obvious to one person having ordinary skill in the art at the time the invention was made to select a bias level for providing gain expansion or phase compression as function of input power, since it has been held that the provision of adjustability, where needed, involves only routine skill in the art. In re Stevens, 101 USPQ 284 (CCPA 1954).

Regarding claims 9-11, Li teaches that the linear power amplifier except for configuring the predistortion circuit (210) to have that gain expansion characteristic and phase compression/expansion characteristic as a function of input power. It would have been obvious to one person having ordinary skill in the art at the time the invention was made to adjust the gain and phase of the linear power amplifier as function of input power, since it has been held that the provision of adjustability, where needed, involves only routine skill in the art. In re Stevens, 101 USPQ 284 (CCPA 1954).

Regarding claims 12, 14, & 16, Li discloses (figure 1) that the linear power amplifier circuit, including: a power amplifier (100) having predetermined characteristics as a function of RF signal input power; and an upstream predistortion circuit (102) for precompensating the predetermined characteristics of the power amplifier, except for showing a means for electronically tuning the predistortion circuit (102).

Gentzler teaches a predistortion compensation for power amplifier comprising a predistortor circuit including that means (52, 60, 62) for electronically tuning the predistortor circuit (see figure 1 and column 3, lines 13-59).

It would have been obvious to one person having ordinary skill in the art at the time the invention was made to incorporate these teaching references in order to generate, for example, a third order intermodulation distortion signal which is used to cancel the intermodulation distortion generated by the main amplifier due to the nonlinearity (see column 1, lines 46-53, of the Li reference).

Regarding claim 13, the reference teaches that the power amplifier is a Doherty amplifier.

Regarding claim 15, Li teaches inherently that the linear power amplifier configured as a Doherty amplifier having a predetermined phase compression characteristic as a function of the input power (see figure 2).

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Prior Art

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclose.

Hau et al. (US 6,353,360), Funada et al. (US 6,417,731), Leizerovich et al. (US 6,374,092), Stengel et al. (US 6,262,629), Butler et al. (US 4,590,436), Katz et al. (US 5,015,965), Long (US 5,886,575), Sigmon et al. (US 5,739,723), Upton et al. (US 5,420,541), Gentzler (US 6,211,733), and Li (US 6,242,979) disclose relevant art to the claimed invention.


Contact Information

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khai M. Nguyen whose telephone number is 703-605-4244. The examiner can normally be reached on 8:30 to 5:00 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael J Tokar can be reached on 703-305-3493. The fax phone numbers for the organization where this application or proceeding is assigned are 703- 308-7724 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-6789.

KN
July 19, 2002


Michael Tokar
Supervisory Patent Examiner
Technology Center 2800